ADAM

Adam Equipment

AE-301 INDICATOR

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1.0 INTRODUCTION

The AE 301 Indicators are general purpose weighing indicators for use cells. The AE 301 MD indicators come with a built-in load cell for conversion of mechanical scale to digital readout by connection of the load cell to the base assembly.

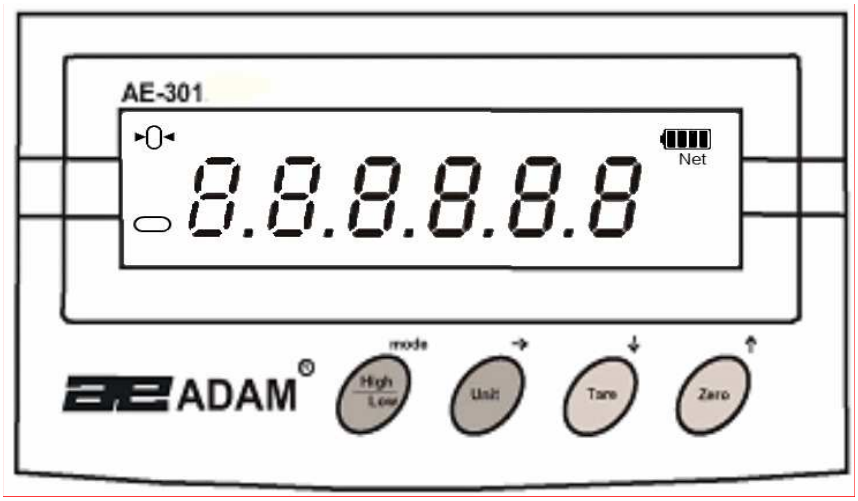
The indicators offer:

- Simple operation
- Zero Tracking
- Selectable automatic backlight
- Check-weighing with low and high limits
- RS-232 interface as standard
- Selectable communication mode
- Operation from internal rechargeable battery or mains power
- 4 weighing units (kg, g, ounce & pound)

2.0 SPECIFICATIONS

Model	**AE 301**	**AE 301 MD-50**	**AE 301 MD-100**
Load cell capacity	-	50 kg	100 kg
Internal Counting resolution	250,000		
Tare Range	Full range		
Units of Measure	4 (kg, g, lb, oz)		
Stabilisation Time	2-3 seconds		
Operating Temperature	0℃ to 40℃		
Interface	RS-232 bi-directional		
Power supply	Re-chargeable battery located or mains power		
Display	Large LCD with backlight		
Calibration	Automatic calibration		
Housing	ABS Plastic		
Dimensions (w x d x h)	260 x 155 x 105 mm		
Net Weight	1.35 kg		

2.1 KEYBOARD AND DISPLAY



The AE-301 indicator has the following symbols:

▸0◂	The scale is at zero
Net	A weight has been tared, the display is showing the net weight
	The battery symbol showing the state of charge. While the battery is being re-charged this symbol will show four bars
	The weight is stable.

The keys perform the following functions:

[High/Low/ Mode]	This key is used during setting of the user functions. It is also used during setting of the High and Low Limits for check-weighing facility and for setting the alarm function.
[Unit/➔]	This key is used to change the weighing units while the indicator is in the weighing mode. It is also used for advancing the digit while the indicator is in the setting mode.
[Tare/🡻]	This key is used to deduct the weight of the container from the gross weight and thus to display the net weight only. It is also used to decrease the digit while the scale is in the setting mode.
[Zero/ 🡹]	This key is used to reset the zero position for accurate weighing while the scale is in the weighing mode. It is also used to the increment digit during the setting mode.

2.2 POWER SUPPLY

- Power can be supplied using an internal re-chargeable battery provided within the indicator case, or from mains power.

- If the battery is low on charge the symbol on the LCD will show just one bar meaning the battery needs to be re-charged immediately. While the battery is being re-charged, this symbol will show four bars.

- With the internal re-chargeable acid battery, the battery life is approximately 60 hours. The battery life will vary depending on the use of the backlight

2.3 LOAD CELLS

- To connect the AE 301 indicator to a new base it is necessary to connect the load cells properly. Then set the parameters for the weighing system.

- User should ensure the load cells are correct for the purpose and the signal from the load cell is correct.

- Note that it may not be possible to measure the voltage signal from the load cell with all DVM. Some DVM will measure the Excitation and signal voltage while others will not. Try measuring the excitation voltage to determine if your voltmeter will work.

CONNECTING TO LOAD CELLS

The AE 301 is supplied with a connector to connect an external load cell.

The load cell can be connected in either a 4 or 6-wired configuration. The standard connection is 4 wired.

Pin 1	Excitation +
Pin 2	Excitation –
Pin 3	Signal +
Pin 4	Signal –

3.0 OPERATIONS

3.1 POWER

- Attach the mains adaptor to the power supply and plug the connector into the socket on the Indicator The indicator will charge the internal battery whenever it is connected to the 220VAC power supply.

- Push the ON/OFF switch at the back right hand side of the indicator to the ON position to power up.

- Push the ON/OFF switch at the back right hand side of the indicator to the OFF position to power down.

3.2 ZERO FUNCTION

- For accurate weighing, zero the display by pressing the key **[Zero]** with nothing on the platform of the scale.

- The zero indicator **→0←** will be on.

3.3 TARE FUNCTION

- When the scale has a container on it press the **[Tare]** key.

- The Tare indicator Net will be shown.

- The display will show zero. If it does not show zero, press the **[Zero]** key.

- To clear the tare, remove the container and press the **[Tare]** key again. Press **[Zero]** to switch off the Tare indicator.

3.4 UNIT SELECTION

- The indicator can be set for different units by pressing the **[Unit]** key. The options are kilogram, gram, pound and ounce. They can be enabled as needed (see section 6.2). Kilogram is always on.

3.5 WEIGHING

- Place the sample on the scale platform. The weight will be displayed in the selected Unit.

- Wait until the stable indicator is displayed for accurate weighing.

3.6 CHECK WEIGHING

Check-weighing is a procedure to sound an alarm when the weight of the sample on the scale meets or exceeds the pre-set Low and High values stored in the memory.

To set the High and Low values, follow the procedure given below-

- Press the **[High/Low]** key. The display will show "**000.00 HI**" with the first digit flashing for setting the High value. To set your limit, use the **[Unit]** key to advance the flashing digit, the **[Tare]** key to decrease the value of the flashing digit and the **[Zero]** key to increase the value of the flashing digit .

- The display will now show "**000.00 LOW**" with the first digit flashing for setting the Low value. To set your limit, use the **[Unit]** key to advance the flashing digit, the **[Tare]** key to decrease the value of the flashing digit and the **[Zero]** key to increase the value of the flashing digit . Press **[Mode]** again to confirm the value and the display will return to normal weighing mode.

- Once the check weighing Limits are set and the alarm function is active, a beep will sound slowly when the sample weight is below the Low Limit. The beep will sound quickly if the weight is above the High Limit. If the sample weight is in between the Limits, the beep does not sound.

3.7 ALARM

3.7.1 Over-load alarming

- When the sample weight on the scale is over the maximum capacity the beep will sound and the display will show “Err“.
- Remove the weight immediately to avoid any damage to the scale.

3.7.2 Low-load alarming

- If the top pan is not placed on the scale the beep will sound.
- Place the top pan on the scale before starting to weigh.

3.7.3 Low battery alarming

- When appears on the LCD, re-charge the battery.
- During re-charging, the symbol will show four bars.
- If this symbol appears, re-charge the battery immediately to avoid any damage to the battery.

4.0 USER PARAMETERS

The following parameters can be set by the user by entering the function setting mode. Press the **[Tare]** key while switching on the indicator. The first parameter will be displayed along with the settings done previously.

- The available parameters can be cycled through by pressing the **[Mode]** key.
- Not all parameters may be enabled. Some parameters may be set during the initial configuration and the user is not given access to them. In this case those will not be seen when the **[Mode]** key is pressed. To use any of the parameters see the corresponding section of the manual.
- Switch off and switch on again to return to weighing when settings are complete.

	Parameters	Description
1.	BLT	Enable / disable the backlight
2.	CHK	Enable / disable the check-weighing facility
3.	FIL	Enable / disable the ADC filter rate
4.	SDT	Sets the RS-232 output function. Options are 1, 2, 3 and 4.
5.	PAT	Sets the following parity options- 8 n 1 - 8 data bits, no parity 7 E 1 - 7 data bits, even parity 7 01- 7 data bits, odd parity
6.	BPS	Changes the baud rate for RS-232 transmission speed. Options are 1200, 2400, 4800 and 9600.

4.1 BLT = BACKLIGHT CONTROL

- When "BLT" is displayed press the **[Unit]** key to change setting

  "**BLT= OFF**" Backlight is disabled.
  "**BLT= On**" Backlight is enabled.

- Press the **[Mode]** key to store the setting and move on.

4.2 CHK = CHECK WEIGHING CONTROL

- When "CHK" is displayed press the **[Unit]** key to change setting

  "**CHK= OFF**" Check weighing is disabled.
  "**CHK= On**" Check weighing is enabled.

- Press the **[Mode]** key to store the setting and move on.

4.3 FIL = FILTERING CONTROL

- When "FIL" is displayed press the **[Unit]** key to change setting.

  "**FIL= OFF**" Filtering function is disabled.
  "**FIL= On**" Filtering function is enabled.

- Press the **[Mode]** key to store the setting and move on.

4.4 SDT = RS-232 CONTROL

- When this function is displayed with the current setting, press the **[Unit]** key to change to the other settings.

  1 Continuous output
  2 Outputs under command from PC
  3 Outputs weight when the scale is stable
  4 Outputs complete data to printer when scale is stable

- Press the **[Mode]** key to store the desired setting and move to the next function.

4.5 PAR = SETTING OF PARITY

- When this function is displayed with the current setting, press the **[Unit]** key to change to the other settings.

  8 n 1 **-** 8 data bits, no parity (default setting)
  7 **E 1 -** 7 data bits, even parity
  7 **0** 1 **-** 7 data bits, odd parity

- Press the **[Mode]** key to store the desired setting and move to the next function.

4.6 BPS = SELECTING BAUD RATE

- When this function is displayed with the current setting, press the **[Unit]** key to change to the other settings. The options are 1200, 2400, 4800 and 9600.

- Press the **[Mode]** key to store the desired setting.

- To return to weighing, switch the indicator off and then on again.

5.0 RS-232 INTERFACE

The BFW series of indicators come with a standard RS-232 interface.

The standard Interface parameters are:	**Connection details are:**
RS-232 output of weighing data ASCII code Selectable Baud Selectable data bits Selectable Parity	Connector: 9 pin d-subminiature socket Pin 3 Output Pin 2 Input Pin 5 Signal Ground

Normal Output: (For **SDT** 1, 2 and 3)

SN ± xx.xxx LL UU	S stands for stable, N for no error G/W for gross weight, LL for OK, HI or LO (during check weighing) UU for the chosen unit(kg, g, lb, oz)

Complete Data Output: (For **SDT** 4)

When the SDT is set to 4 (see section 4.4), it will send 6 lines of data to the printer in the following format

<SOH><cr><lf>	First line is blank
G±sp spXX.XXXsp sp <kg><cr><lf>	Gross weight printed
T±sp spXX.XXXsp sp <kg><cr><lf>	Tare weight printed
N±sp spXX.XXXsp sp <kg><cr><lf>	Net weight printed
<cr><lf>	Blank line
<cr><lf>	Blank line
<EOT>	End of Transmission

Input commands format:

The indicator can be used from a PC with the following commands. The commands must be sent in upper case letters, i.e. "**T**" not "**t**" and press the Enter button.

N	Sends the net weight to the RS-232 interface.
G	Sends the gross weight to the RS-232 interface
T	Sends the tare weight to the RS-232 interface.
Z	Zero the indicator to display the net weight. This is the same as pressing **[Tare]** or **[Zero]**.
Lxx.xxx	Sets the lower limit. Same as pressing the **[High/Low].**
Hxx.xxx	Sets the upper limit. Same as pressing the **[High/Low]**.
C0	Disable check weighing.
C1	Enable check weighing.

6.0 TECHNICAL PARAMETERS

To enter this section, press and hold the **[Mode]** and the **[Tare]** key while you turn on the indicator. The display will show the revision number and then the first parameter Zero Tracking as "**ZEO**"

6.1 ZERO TRACKING

- When **ZEO** is displayed, press **[Unit]** to change to the other setting.

  "**ZEO= OFF**" Zero tracking function is disabled.
  "**ZEO= On**" Zer0 tracking function is enabled.

- Press the **[Mode]** key to store the desired setting and move to the next function.

6.2 UNIT SETTING

The user will be able to enable the weighing units to be used - grams, pounds or ounce. Kilogram is the default weighing unit.

- When **g** is displayed, press the **[Unit]** key to change to the other setting.

  "**g= OFF**" Gram unit is disabled.
  "**g= On**" Gram unit is enabled.

- Press the **[Mode]** key to store the desired setting and move to the next unit setting.

6.3 CALIBRATION

The next section is the Calibration section.

A weight value and. "**WEI**" will be displayed.

- When **WEI** is displayed, press the **[Unit]** key to scroll through the options for selecting the calibration mass.
- To select the desired mass press the **[Mode]** key.
- The raw ADC count will be displayed along with "**CAI**".
- To set the zero calibration, press the **[Mode]** key again.
- The scale will display **"0 LOD", place** the calibration mass selected onto the top pan, the display will show the raw ADC counts of the selected calibration mass, then press **[Mode]** again.
- The display shows PASS and then returns to normal weighing
- Remove the weight and continue to use.

7.0 TROUBLE-SHOOTING GUIDE

PROBLEMS	POSSIBLE CAUSES
Display is blank	On/Off switch on rear panel is off Indicator not turned on Battery not charged
No countdown of display on power up	Battery not charged Power supply not plugged in or incorrect type Power supply faulty Display turned off
Error message displayed - Err	Overload Load cell damaged
Display is unstable	Drafts or air currents Load cell connections not secure Obstruction under weighing platform Vibrations through the floor Temperature changed dramatically Power supply faulty
Weight value incorrect	Calibration error, Recalibrate Unit calibrated with inaccurate weight Obstruction around platform
Cannot use Full Capacity	Overload stops hitting platform support or hitting bottom of load cell Parameters set incorrectly Load cell Damaged
Not Linear	Overload stops hitting too soon Load cell damaged
Off Center Loading error	Overload stops not set correctly Load cell damaged
Battery will not charge	Incorrect power adaptor being used Charging circuit failure Battery failure Main voltage not present or too low

8.0 SERVICE INFORMATION

This manual covers the details of operation. If you have a problem with the indicator that is not directly addressed by this manual then contact your supplier for assistance. In order to provide further assistance, the supplier will need the following information which should be kept ready:

A. Details of your company

-Name of your company:
-Contact person's name:
-Contact telephone, e-mail,
fax or any other methods:

B. Details of the unit purchased

(This part of information should always be available for any future correspondence. We suggest you to fill in this form as soon as the unit is received and keep a print-out in your record for ready reference.)

Model name of the product:

Serial number of the unit:

Software revision number
(Displayed when power is first turned on):

Date of Purchase:

Name of the supplier and place:

C. Brief description of the problem

Include any recent history of the unit. For example:
-Has it been working since it's delivered
-Has it been in contact with water
-Damaged from a fire
-Electrical Storms in the area
-Dropped on the floor, etc.

WARRANTY INFORMATION

Adam Equipment offers Limited Warranty (Parts and Labour) for the components failed due to defects in materials or workmanship. Warranty starts from the date of delivery.

During the warranty period, should any repairs be necessary, the purchaser must inform its supplier or Adam Equipment Company. The company or its authorised Technician reserves the right to repair or replace the components at any of its workshops depending on the severity of the problems. However, any freight involved in sending the faulty units or parts to the service centre should be borne by the purchaser.

The warranty will cease to operate if the equipment is not returned in the original packaging and with correct documentation for a claim to be processed. All claims are at the sole discretion of Adam Equipment.

This warranty does not cover equipment where defects or poor performance is due to misuse, accidental damage, exposure to radioactive or corrosive materials, negligence, faulty installation, unauthorised modifications or attempted repair or failure to observe the requirements and recommendations as given in this User Manual. Additionally rechargeable batteries (where supplied) are not covered under warranty.

Repairs carried out under the warranty does not extend the warranty period. Components removed during the warranty repairs become the company property.

The statutory right of the purchaser is not affected by this warranty. The terms of this warranty is governed by the UK law. For complete details on Warranty Information, see the terms and conditions of sale available on our web-site.

CE

Manufacturer's Declaration of Conformity

This product has been manufactured in accordance with the harmonised European standards, following the provisions of the below stated directives:

Electro Magnetic Compatibility Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Adam Equipment Co. Ltd.
Bond Avenue, Denbigh East
Milton Keynes, MK1 1SW
United Kingdom

FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded interconnect cables must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device.

Changes or modifications not expressly approved by Adam Equipment could void the user's authority to operate the equipment.

WEEE COMPLIANCE

Any Electrical or Electronic Equipment (EEE) component or assembly of parts intended to be incorporated into EEE devices as defined by European Directive 2002/95/EEC must be recycled or disposed using techniques that do not introduce hazardous substances harmful to our health or the environment as listed in Directive 2002/95/EC or amending legislation. Battery disposal in Landfill Sites is more regulated since July 2002 by regulation 9 of the Landfill (England and Wales) Regulations 2002 and Hazardous Waste Regulations 2005. Battery recycling has become topical and the Waste Electrical and Electronic Equipment (WEEE) Regulations are set to impose targets for recycling.

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ADAM EQUIPMENT is an ISO 9001:2008 certified global company with more than 35 years experience in the production and sale of electronic weighing equipment.

Adam products are predominantly designed for the Laboratory, Educational, Medical, retail and Industrial Segments. The product range can be described as follows:

-Analytical and Precision Balances
-Compact and Portable Balances
-High Capacity Balances
-Moisture analysers / balances
-Mechanical Scales
-Counting Scales
-Digital Weighing/Check-weighing Scales
-High performance Platform Scales
-Crane scales
-Medical Scales
-Retail Scales for Price computing

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